YRB 71-10

THE TEXAS GRAIN SORGHUM OBJECTIVE YIELD STUDY

UNITED STATES DEPARTMENT OF AGRICULTURE

STATISTICAL REPORTING SERVICE

Prepared February, 1971

I. GENERAL INFORMATION

A. Introduction

Your Interviewers Manual gives you the necessary instructions and also contains answers to most problems you will meet on the job. Study this manual before starting your work and carry it with you at all times when making your observations.

The information is arranged in the order in which you will be using it. Become familiar with your manual. Read it thoroughly before work begins. Refer to it when you have a problem or become doubtful as to the proper procedures. In addition to this manual you will be furnished a Survey Enumerator's Handbook which covers administrative instructions and information about your job and the Statistical Reporting Service.

B. Your Job

You are one of ~~three~~ several enumerators who will be visiting grain sorghum growers to obtain information about their crop. You will interview the operator and also make counts, measurements on some grain sorghum heads and also clip several heads in one of his fields. The information you obtain will be used to test both field and laboratory procedures and of different variables which might be used in forecasting weight of grain per head.

You will hear the term "Objective Yield Survey" used frequently. The term "Objective" means that the basic information is based upon actual counts and measurements. Objective yield studies are scientifically designed, and plant observations and measurements must be made precisely according to rigid rules. The accuracy in future years depends directly upon the performance of you and all other enumerators working on this survey.

The first part of your job will be to contact certain grain sorghum growers who reported grain sorghum on the 1970 June Enumerative Survey. You will interview each grower on your list to find out information about his grain sorghum fields this year that are inside the June segment. You will also obtain permission to work in a certain grain sorghum field of his.

After the interview you will enter the sample grain sorghum field and layout two units for sampling purposes. You will make counts, measurements, and clip heads in each unit. The grain sorghum heads will be placed in separate paper bags and sent to the State laboratory ~~in Austin~~ Oklahoma City. It is important to use correct procedure and to record all information carefully.

Each enumerator will be trained in the field when the survey starts. Procedures, definitions and forms will be explained at that time. You will receive a sample kit envelope for each sample field of grain sorghum. This envelope will contain the necessary forms and the name and location of the growers selected.

C. Turning in Completed Work

You will be working from your home. All of your work will be sent directly to one of the State offices ~~(Austin or~~ (Oklahoma City). Therefore, it is important that you review your work for each sample field before mailing. Make sure all required data are entered and that problems are fully explained in notes.

Envelopes will be provided for mailing in completed forms. Cloth mailing sacks and boxes will be used for mailing laboratory samples. It in very important that laboratory samples are identified and packaged properly.

When your survey work in finished you will return all equipment and unused supplies as directed by the state office.

D. Equipment and Supplies

You will be furnished the following items of equipment and supplies. Check to see that you have everything shown on the list. You are responsible for the proper use and care of all items furnished. Notify the state office if you run out of supplies or if equipment becomes inoperable.

ITEM	ITEM
( ) USDA Indentification Card	( ) Form CEF - 201, white envelop
( ) Accident Report Kit	( ) Kraft mailing envelopes
( ) First Aid Kit	( ) Pencils
( ) Clipboard	( ) Ball Point Pens
( ) Cloth Mailing Sacks	( ) Rubber bands
( ) Cardboard Mailing Boxes	( ) 4 Itek prints of each segment
( ) Mailing labels ([redacted] Okla.)	( ) Red & Blue Pencils for Iteks

ITEM	ITEM
( ) Black Marking Pencil	( ) Random Number table for select field
( ) Random number for unit locations	( ) 50' tapes
( ) Florist Stakes	( ) ID Tags
( ) Caliper	( ) Cloth with measuring tape
( ) Clippers	( ) Surveyors Pin
( ) Paper Bags for heads	( ) Sample Kit Envelopes
( ) Flagging Tape	

E. Administrative Intructions

Your blue Survey Enumerator's Handbook explains how to complete the time and mileage for CEF-201 and other forms such as accident reports. Salary and mileage will be paid in separate checks.

II. THE SURVEY

A. Purpose of the Survey

The Crop Reporting Service is a government agency designated to make official forecasts and estimates of crop production in the United States. The Service publishes monthly crop reports during the growing season giving crop forecasts of the major crops for all states. These reports are furnished free to anyone interested. The function of the Service is to serve as an unbiased agency in making forecasts which are necessary in the pricing and efficient marketing of agricultural crops. For the most part this information for forecasts has been obtained from mailed inquires from growers. This method provides reasonably dependable forecasts and is relatively inexpensive. As farming becomes more specialized more and more reliance are being placed on individual forecasts.

In an attempt to meet this need the Service has developed other methods of forecasting by obtaining in-field counts and measurements rather than depending solely upon judgement estimates from growers. Such information includes counts of stems or stalks or heads, size of ste and heads as well as weight of heads. These data are called objective measures.

This survey is a small scale test of both field and laboratory procedures and of different variables which might be used in forecasting weight of grain per head. Data from this survey would be used in constructing a pilot survey over a large area in the future.

B. How the Sample was Selected

Twenty tracts were selected from the 1970 June Enumerative Survey

with probabilities proportionate to 1970 acreage of grain sorghum for harvest. These selected tracts will be screened at survey time for grain sorghum this year. Sample fields will then be selected by probability proportionate to size of field. A sample is a portion of a given population selected to represent that population. In this procedure every field has a chance of being selected. This also means that a field of 100 acres has twice as much chance of being selected as a field of 50 acres.

In a sample field, each plant or area has an equal chance of being selected. This is a basic principle of sampling and is often misunderstood. The farmer may not understand when you make counts on the poorest or best area in the field. In fact, he will sometimes offer to help locate area that in "better" or "more typical" or "in better soil". The sample area is not intended to represent a single field. Each sample area represents all the other areas similar to it in the whole production area.

C. Survey Forms to be Used

Sample Kit Envelope -- you will be given a sample kit envelope for each field to be sampled. This will be a large brown evelope containing the survey forms you will need for the grower interview and field forms for each unit in the sample. If the same grower operates blocks containing two or more samples there will be a kit envelope for each sample.

The sample number and name and address of the operator is listed on the face of the envelope. There will also be room on the envelope to draw an outline of the field and to locate the two units within this area.

Form A -- This form will be used to record information obtained when the grower is first interviewed. One form A will be completed for each sample field. Permission to go into the field will be obtained at this time.

Itek Print -- This is an aerial photo of the segment in which the tract is located. The location of the sample tract is shown on the print. A large scale map will be attached to help locate the segment.

Form B -- One form B will be completed for each unit in the sample. The location of the unit will be entered on this form. It will also be used as a recording sheet for the counts and measurements that are needed.

ID Tag -- A completed ID tag will be used to identify each head that is clipped and sent to the laboratory.

III. FORM A INTERVIEW

A. Contacting the Operator

The operator's name, address and phone number are entered on the outside of your kit envelope. You will also have a county map and an Itek print showing the location of the segment where his fields are located.

B. Who to Interview

As a general rule, the name shown on the kit envelope will be the operator of the farm. He may be an owner, a renter or a manager. In all cases, the person to interview will be any well informed person connected with the operation who can provide the information on Form A and can give you legitimate permission to make monthly counts in one of the grain sorghum fields.

C. Contact Procedure

Initial contact should be made by telephone to set up an interview time. If operator cannot be contacted by phone, initial contact can be made at the time of arriving at the segment. ~~In Cameron, Hidalgo and Willacy Counties we will want to contact all farmers for the initial interview before doing any field work. In these counties aerial photographs will be taken of each segment at the time of the field work.~~ Before field work starts an identifying board with be placed in the corner of each sample field.

D. Special Situations

1. Unable to Locate Operator -- If, after reasonable effort has been made you are still unable to locate an operator, check with your supervisor. He will check the records to make sure you have the correct name and address.

2. New Owner or Operator -- If the management of the farm is now different from that shown on the kit envelope enter the name and address of the new operator on the kit envelope and interview him to complete the Form A.

3. Operator has Moved -- Find out the new address and record it on the kit envelope. Contact him at his new address to complete the Form A.

4. Grower refuses to give information -- and for permission to make counts -- Notify your supervisor in this case. A new sample may or may not be selected.

E. Form A

Identification data -- The heading of Form A (Crop Code, State, Segment and Sample No.) will have been completed. However, you must enter the date and starting time on the line provided but not in the adjacent answer box.

Opening Statement and Permission -- "Last year a representative from our office obtained some information about your farming operation. At that time, you stated that you had one or more fields planted to grain sorghum. Now as part of a small research project, we are contacting a few operators who reported grain sorghum last year. Do you have grain sorghum planted this year inside these tract boundaries?"

( ) Yes ( ) No

If No, conclude the interview unless there is a new operator of this tract. If there is, find out who the new operator is and contact him.

Read or in your own words tell the respondent the above statement. If his answer is No, check to see if he still operates that land or if there is a new operator. If there is a new operator, find out where you can locate him and enter his name and address on the outside of the kit envelope. Contact him before continuing the interview. If he still operates it but has no grain sorghum, conclude the interview. If the answer is Yes, continue.

"We would like information about your crop and permission to lay out small plots and make monthly counts in one of your fields. Will this be all right?"

( ) Yes ( ) No

If the answer is No and you cannot get him to change his mind, conclude the interview and report the refusal to your supervisor.

Item 1 -- Can you show me the location of your grain sorghum fields on this map?

(a) Outline all fields on itek photo and number (as he points the fields out to you) using a red pencil.
(b) List the acreage for each field below and accumulate.

In the table below the question take one field at a time as you numbered them on the Itek print.

(a) Field No. -- List the field numbers from 1 thru n as on photo.
(b) Acres in Field -- List total acres in field including fence rows, etc.
(c) Acres planted to Grain Sorghum -- List acres in field that were originally planted to grain sorghum.
(d) Acres Plowed, Abandoned, etc -- List acres that were plowed up or abandoned for some reason.
(e) Acres not Intended for Grain -- List all acres planted that will not be harvested for grain.
(f) Net Acres to be Harvested for Grain -- Subtract c and d from b to get the net acres for harvest and check this with the operator.
(g) Accumulated Net Acres to be Harvested for Grain -- Accumulate the acres listed in column f to get a total net acres of sorghum to be harvested for grain.

Total up columns c and f. The total for column f should equal the last entry in column g.

Item 2 -- Then this makes a total of (col. c total) acres planted to grain sorghum and (col. f Total) acres intended to be harvested for grain. Is that right?

Fill in the blanks from the above table. If he does not agree, go back and determine where you went wrong.

(a) If no sorghum is to be harvested for grain conclude the interview.
(b) If only one grain sorghum field is inside the tract boundary, it becomes the sample field.
(c) If more than one field is in the tract, select a random number between 1 and the total acres to be harvested. The field containing the selected acre becomes the sample field.

(Sample acre selected _____)

Part a and b here are self explanatory. For part c a table of random numbers will be provided for determing the sample acre. Each enumerator will be given a designated starting point on the table. List this sample acre in the space provided and then circle the field number in the table that contains this selected sample acre.

Example: The following portion of table from Form A will be used to show how a sample field is selected as in Item 2 part c.

Field No. (a)	Acre in Field (b)	Net Acres to be Harvest for Grain (f)	Accumulated Net Ac to be Harvest for Grain (g)
1	22.5	22.0	22.0
2	16.0	16.0	38.0
3	75.0	75.0	113.0
(4)	89.2	89.0	202.0
5	36.0	36.0	238.0
		238.0	

The table shows 5 fields that were reported by the farmer being planted to grain sorghum. In summing up column (f) and accumulating acres in column (g) we find we have 238.0 net acres to be harvested for grain. In using the random number table shown at the left we would choose 123.6 as the sample acre. This is done by assuming the first number represents 765.0 acres, the 2nd 801.1 acres, etc. which are all larger than our total net acres until we get down to 123.6 acres. Since this, is the first number which lies between .1 and 238.0 it becomes the sample acre. Looking up in our table we find

Random Number Table	
7650	2454
8011	9765
3632	(1236x)
4503	0037

that acre 123.6 would fall in field 4 so this becomes our sample field

Item 3 -- The following questions pertain only to the selected sample field.

(a) On what date was this field planted (_____)
(b) What variety of grain sorghum is planted in this field? (_____)
(c) Is this field irrigated? Yes ( ) No ( )
(d) What is the probable date of harvest? (_____)

These questions are self-explanatory, just be sure the respondent knows which field you are talking about. Enter the answer in the space provided and not in the box at the right.

Item 4 -- "After you have harvested this field I would like to come back and get some information from you as to the yield and also to lay out a couple of small plots to check for any harvesting loss. Would this be all right?" Yes ( ) No ( )

After all items are complete, copy the probable date of harvest to the front of the kit envelope for possible later use. Also, copy the net acres to be harvested for the sample field to the post harvest interview form. Sign your name and enter time of completion or ending time.

IV FORM B FIELD OBSERVATIONS

Two Form B's will be used for each sample, that is, one Form B for each unit. The two units are not combined on one form.

The point of entry into the field will be the first corner of the field which is reached when approaching the field. If the field has no definite corners, enter the field from the point which is most accessible by car. If the field has been selected for more than one sample, the second closest corner will be used as the starting corner for the second sample number.

Item 1 -- UNIT LOCATION: (first visit only) Acres in Sample Field _____.

Copy acres in sample field from Form A to Form B.

To determine the unit locations there is a table of Unit Locations with the supplies. The table is set up for four different field size as indicated at the top of the table. To determine which column is to be used refer to the acres in the sample field. The first unit locations to be used in each column are checked in red. Unit locations are shown for both unit 1 and unit 2.

For example, if your first sample field is 8 acres, you will look down the "Less than 10 Acres" column unit you come to the red check mark. If the 9th row down was the starting point, the location of the units would be 34 rows along the edge of the field and 4 paces into the field for Unit 1 and 39 rows along the edge of the field and 86 paces into the field for Unit 2. Enter these numbers on the appropriate forms for Unit 1 and Unit 2.

BEGIN TIME -- Enter here the time you are ready to leave the car and go to the starting point in the field.

Steps to locate units in the field.

Unit 1 and Unit 2 are located independently of each other. The starting rows for Unit 1 and for Unit 2 are given on the line reading "Number of rows along edge of field". The line reading "Number of paces into field" gives the number of paces you must walk into the field before laying down the dowel stick to define the unit location. Unit 1 should always be laid out before Unit 2, even though in many instances Unit 2 will be closer to the point of entry into the field.

Step 1:

Mark the starting corner so it will be clearly visible on later visits. Tie a piece of plastic flagging ribbon to a fence or some nearby object or drive a large stake in the ground and attach the ribbon. Make a note of the location and type of marking used on the kit envelope field sketch.

Step 2:

Walk along the end of the crop rows until you have counted off the number of crop rows indicated for Unit 1. This will be Row 1 of Unit 1; the next row further away from the starting corner will be Row 2 of Unit 1. Tie a piece of flagging ribbon on the first stalk in Row 1. This will help you find the same row on subsequent visits to the sample field.

Step 3:

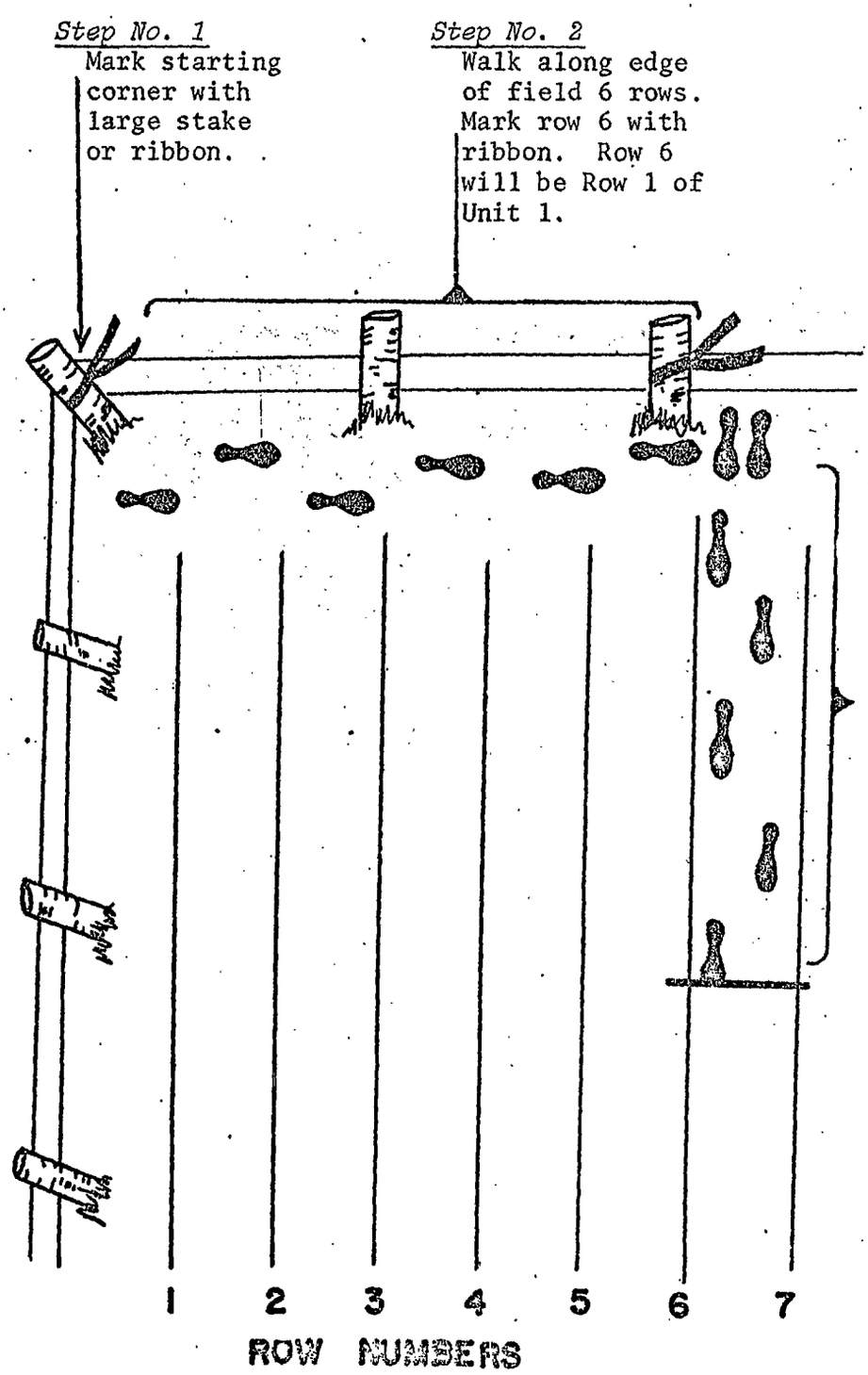
Then walk the required number of paces (steps) into the field along the middle between Row 1 and Row 2. Start your first pace about one and a half feet in front of the plowed end of Row 1. This starting point applies even if plants are not growing to the plowed end of Row 1.

Step 4:

After you have taken the last of the required paces, lay the dowel stick down so that it touches the toe of your shoe. The dowel stick should be laid down across Row 1 and Row 2, and at right angles to the direction of the rows.

GENERAL INSTRUCTIONS FOR LOCATING UNITS

For example if Unit 1 is located 6 rows along the edge of the field and 5 paces into the field:



Arrival at Unit Time -- Enter time of arrival at unit location. At the time of the first visit this time will be after you have counted rows across the end of the field and paces into field and have laid the dowel down. On the other visits it will be the time you reached the unit indicated.

Item 2 -- Lay out Sample Unit: (first visit only)

The following steps and diagrams will indicate how each one of the units is to be laid out after reaching the location.

Step 1:

Anchor the zero end of the 50 ft. steel tapes just beyond the dowel stick and directly along side the plants in Row 1. The zero end of the tape must be anchored firmly and close to the ground so it will not move when the measurements are being made. Mark the sample number on a florist stake and insert it at the anchor point.

Step 2:

Insert a "starting" florist stake, identified "U1 S1" for Unit 1 and ~~Section 1~~ exactly at the 5 foot mark. Next insert stakes exactly at the 10, ~~15 and 20~~ foot marks. These stakes should be placed straight up and down with the flat side at right angles to the row direction and as close to the center of plants in Row 1 as possible. ~~Label stakes inserted at the 10 and 15 foot marks as "U1 S2" and "U1 S3".~~

Step 3:

Anchor the 50 foot tape just beyond the dowel stick and directly along side the plants in Row 2. No florist stake should be placed by anchor for Row 2.

Step 4:

For Row 2 insert a "starting" florist stake at the 5 foot mark and stakes at the 10, ~~15 and 20~~ foot marks. Mark the starting florist stake as follows: "U1 S4" for Unit 1 and ~~Section 4~~ Row 2 indentification. ~~Also, identify stakes at the 10 and 15 foot marks as "U1 S5" and "U1 S6".~~ Do not move the florist stakes for any reason; they define the ~~three~~ 5 foot count sections.

Step 5:

For Row 3, the dowel stick must be slid straight across so it now lies across rows two and three. Then anchor the 50 foot tape just beyond the dowel stick and directly along side the plants in Row 3. No florist stake should be placed by anchor for Row 3.

Step 6:

For Row 3 insert a "starting" florist stake at the 5 foot mark and ~~stakes~~ at the 10, ~~15 and 20~~ foot marks. ~~Mark the starting florist stake as follows "U1 S3" for Unit 1 and Section 7 identification. Also label stakes at 10 and 15 foot marks an "U1 S8" and "U1 S9".~~

Step 7:

Tie a 2 foot piece of flagging ribbon near the top of the first plant included in the unit for each ~~section~~. Use Rule 1 at the starting stake for ~~each count section in~~ each row.

Rule 1: If a plant emerges from the ground exactly at the starting stake, include that plant in the section. Include the entire hill if any plant in a hill is included at the starting stake.

Step 8:

Tie a 2 foot piece of flagging ribbon near the top of the last plant inside the unit for each ~~section~~. Use Rule 2 at the ending stake in each ~~section~~.

Rule 2: If a plant emerges from the ground exactly at the ending stake, exclude that plant from the count section. Exclude the entire hill if any plant in a hill is excluded at the ending stake.

Item 3 -- Measure the distance across four (4) row spaces.

This distance will be measured at the point where the dowel stick crosses the rows. Anchor the 50 foot tape in the center of row 3 and stretch it back across row 2 and row 1 plus two more rows which lie outside the unit. The following diagram shows it in more detail.

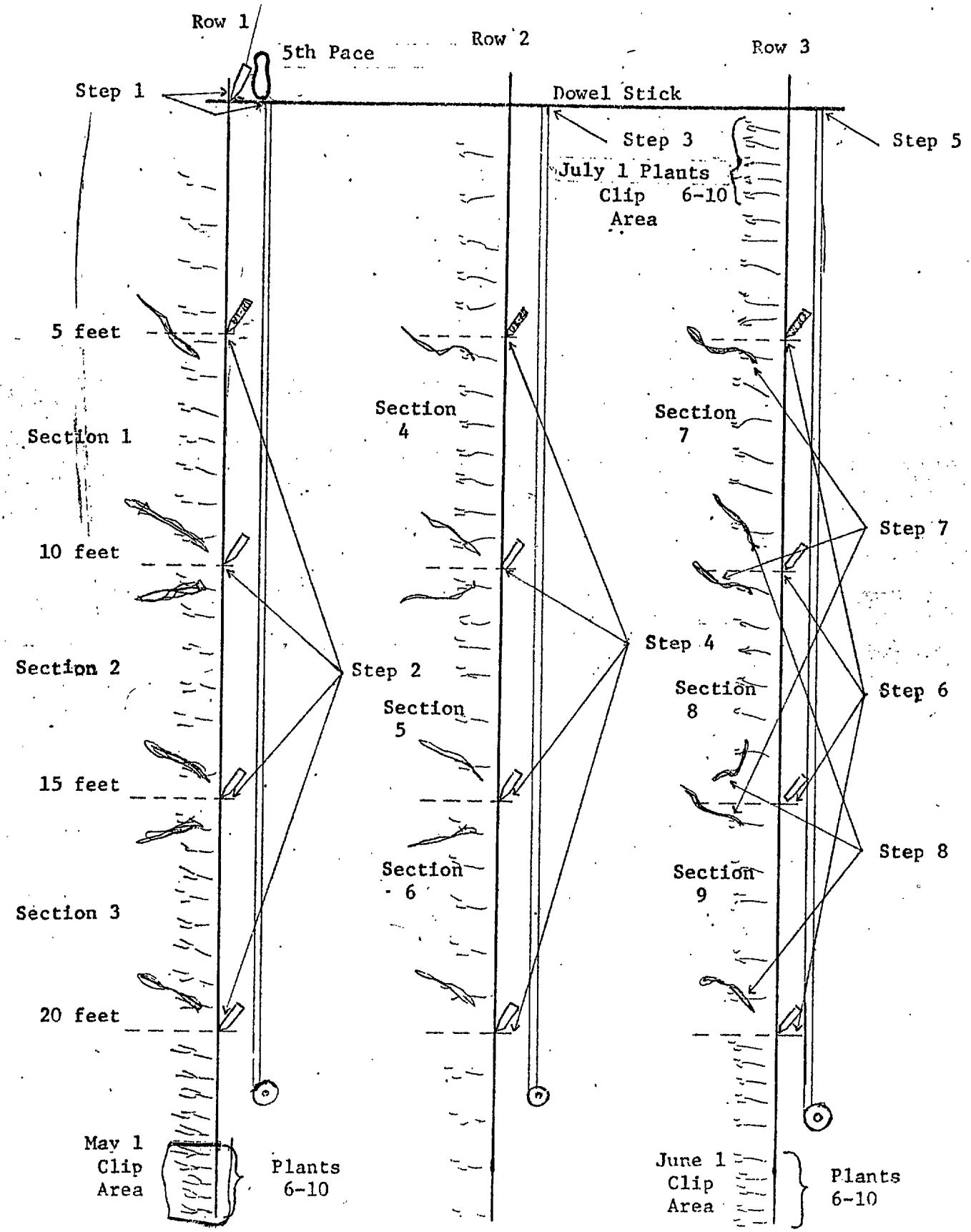
Step 1:

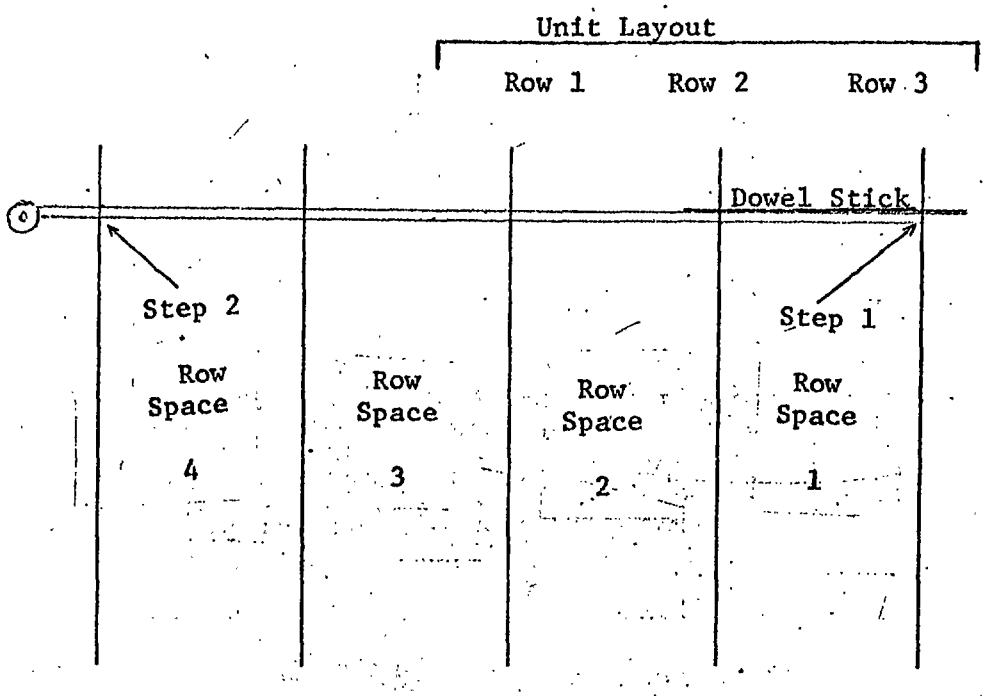
Anchor 50 foot tape in center of row 3.

Step 2:

Stretch 50 foot tape across 4 row spaces (5 adjacent rows) to the cent of the 5th row. Read the measurement in feet and tenths of feet and enter on Form B.

LAYING OUT AND MARKING UNITS





Time Completed -- At this time we will combine all of the "time completed" boxes on the right hand side of the form for one explanation. As you complete the items previous to each of these boxes, enter the time of completion in the appropriate box. Anytime an item is skipped, the time completed is also skipped.

Item 4 -- Determine Stage of Maturity for Unit

Circle the appropriate code of 1 through 6 and enter in box at right depending on stage of maturity. When examing heads, do so in a bordering row, preferably next to row 1.

1. Head not emerged: If a least 50 percent of the heads have not emerged inside of the unit or are not visible circle code 1. A head is considered emerged if any spikelets can be seen through a split in the leaf sheaf or beyond the leaf.

2. Preflower: At this time 50 percent or more of the heads have emerged but no flowers have appeared yet on the fluoresence or head of the grain sorghum plant.

3. Flower: This stage will be very short. At the time it is in flower, the head may appear to have a yellowish hue when the flower parts are showing.

4. Milk: Kernels are formed in heads. Kernels of grain are soft, moist and milky. When the grain is squeezed, a milky liquid can be observed.

5. Dough: The grains can be crushed between the thumb and fingernail, the contents of most of the grains are soft and can be kneaded like dough with only a few grains per head containing any milky liquid.

6. Mature: The grains readily part from the head and are likely to shake out of the glumes. The grain is firm and though it may be dented by presure of the thumbnail, it is not easily crushed or if so breaks into fragments.

If maturity code is 4 through 6 go to Item 6.

The counts needed in Items 5 through 8 are taken by ~~sections~~ ٣٥ س. Refer to the diagram on laying out units to see how sections are numbered.

Item 5 -- Count and record the number of stalks in each ~~sections~~ ٣٥ س

The number of stalks in each 5-foot row ~~section~~ is to be counted. Count all stalks inside the ~~section~~ ٣٥ س, regardless of size or condition.

Any stalks growing in the row space between Row 1 and Row 2 are to be included in the count for Row 1. Likewise, stalks between Row 2 and Row 3 should be included in the count for Row 2 and Row 3.

Item 6 -- Count and record the number of emerged heads in each ~~section~~ ٣٥ س

These are to be counts of all heads attached to stalks which emerge within the count ~~section~~ ٣٥ س. A head is to be counted as an emerged head if any spikelets can be seen through a split in the sheaf leaf or beyond the leaf.

Maturity stage 3 through 6 only for Items 7 and 8 otherwise skip to Item 9

Item 7 --- Tagged Plants Inside Count ~~Sections~~ Rows

The five parts to Item 7 refer only to the ~~two~~ twelve tagged plants in each section, which are selected in Item 7a.

(a) Randomly select ~~2~~ four heads in each count ~~section~~ row. Identify and record the selected head with the corresponding sample head number indicated below.

The counts made in Item 6 will be used here to determine which ~~two~~ four heads to tag in each count ~~section~~ row. Use the "Random Number Table for Determining Plants to Tag" to determine which two plants in each section to tag. For each ~~section~~ row pick ~~two~~ four random numbers between 1 and the number of plants in each ~~section~~ row. Then list these two numbers in numerical order in 7a for that particular section. Study the following example.

First we will show number of emerged heads as would be indicated in Item 6.

	Number of Emerged Heads		
	~~Section 1~~	~~Section 2~~	~~Section 3~~
Row 3	18	36	40
Row 2	13	27	10
Row 1	35	30	21

Second we will show a portion of the random number table.

54	96	75
~~15~~ 15	34	~~16~~
85	~~86~~	46
61	62	42
~~05~~ 05	47	81
41	98	68
~~23~~ 23	24	20
~~17~~ 17	96	58
~~40~~	90	70
82	55	94

Row 1 section 1 shows 35 emerged heads. We want to select four numbers between 1 and 35. In looking at the random numbers table we find 15 and 5 are the first four numbers in this range. As you use these numbers cross them out in some fashion. The four numbers just picked are copied into table 7a putting the smallest one in first as shown below.

Row 1 section 2 has 30 emerged heads. In going to the random number table we start at the point where the last number was selected. In this case it was five. The next two random numbers we can use become 28 and 17. Then list these two numbers in table 7a.

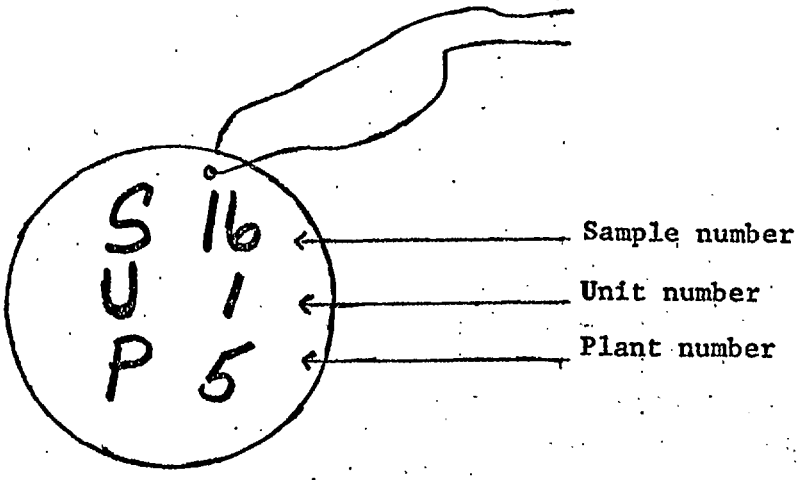
Row 1 section 3 is also worked out as an example. See if you can follow the procedure there.

Table 7a

	Section 1		Section 2		Section 3	
	13	14	15	16	17	18
Row 3						
	7	8	9	10	11	12
Row 2						
	1 5	2 15	3 17	4 23	5 6	16
Row 1						

Go thru and selected all 18 plants for the unit before beginning the tagging operation. The typed number in the upper left hand corner of each square becomes the tagged plant number. This number will be shown on the ID tag.

Now we must make up 18 ID tags to fasten to the selected plants. For this purpose we use a metal encased round tag. Use a ball point pen to write on these tags. The following identification will be written on each tag.

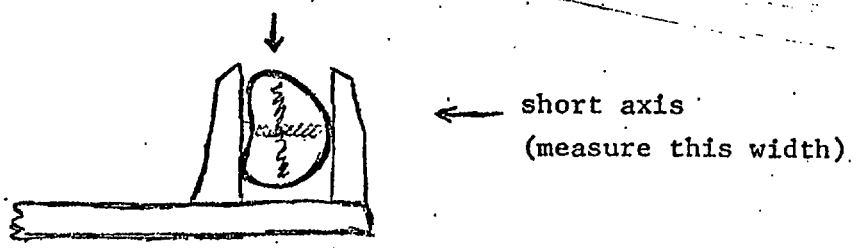


Attached these tags loosely around the stem of the plant and above the top leaf. The heads of these plants will be clipped later in the season and these tags must be kept with this particular head it belongs to.

The plants selected here will be used the remainder of the season. So once these plants have been selected you will skip 7a on the remainder of your visits to the field.

(b) For the tagged plants, measure the diameter of stalks in each section.

The diameter of the stalk will be measured for each tagged plant at a point 1 inch below the head of the plant. You will find a calipers in your supplies to use for this purpose. The stalk very probably will not be round so the stalk must be measured across the shortest axis or shown below.



Record the measurement in the appropriate space on Form B.

(c) For tagged plants, measure the length of the heads in all ~~sections~~ rows.

The length of the head for each tagged plant will be measured from the point of attachment of the lowest fruiting branch to the top of the tallest fruiting branch. Some of the lower branches in the head may not have fruit on them or may be missing entirely.

(d) For tagged plants, measure circumference of the heads in all sections.

A wrap around cloth with a cloth measuring tape will be provided in the supplies. The cloth will be wrapped around the head of the plant so the tape will measure the head at the largest point. The cloth should be wrapped tight enough so the branches are pulled up into a compact group. The circumference of the head can then be read diretly from the cloth tape wrapped around the outside.

If unit is in code 3-5 skip item 7e

(e) If units is mature (code 6), clip each of the tagged heads and place each in a separate paper bag for shipment to laboratory at Oklahoma City.

If the unit is mature each of the tagged heads will be clipped about 4 inches below the base of the head. Shears will be provided in the supplies for this purpose. As each head is clipped place it in a separate paper bag along with the ID tag on the plant. Write the same identification on the outside of the paper bag with a marking pencil as is on the ID tag. Seal the paper bag with a rubber band.

These heads will then be packed in a cardboard box for shipment to the state laboratory at Oklahoma City.

If unit is mature (code 6), skip item 8

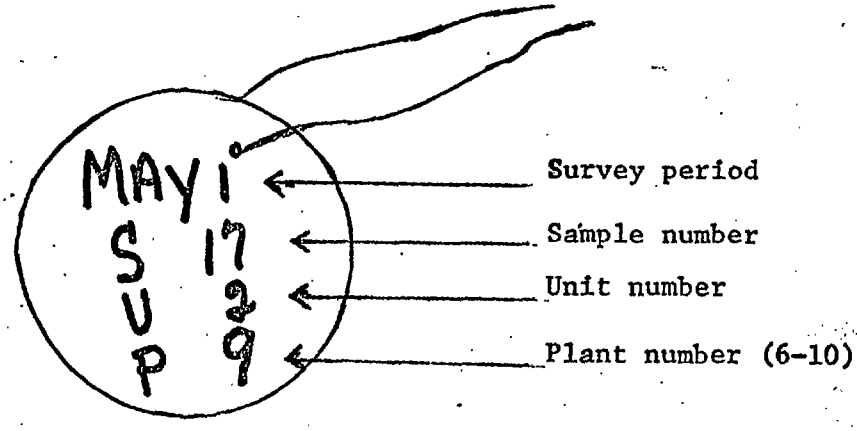
Item 8 -- Counts made outside count section

Maturity codes 3 through 5 only

Locate and tag the 6th through 10th heads outside the unit in the pre-designated row.

Refer to the unit layout diagram shown earlier to find the location of the pre-designated row depending whether the visit is May 1, June 1, or July 1.

Make up five ID tags to be placed on the 6th through 10th head in the pre-designated outside row of the count section. The ID tag will contain the same information as before with one added item which is the survey period (May 1, June 1, or July 1).



Tie the tags to the stem quite snug just below each head so it will stay when the heads are clipped.

After the heads have been properly tagged, measurements must be made on each head. You must measure the diameter of stalk, length of head and circumference of head the same as indicated in the previous instructions for the tagged plants inside the count unit.

When all the measurements have been made and recorded, each head will be clipped 4 inches below the head, these will be placed in separate paper bags along with the ID tag and secured with a rubber band. Write the identification on the outside of the paper with the marking pencil. These heads will then be placed in a cloth mailing bag and sent to the State laboratory at Austin.

Item 9 -- (first visit only) measure the distance (in feet and tenths) from the unit (number of feed out of and along edge of field) to the starting corner.

The distance will be measured from the corner of row 1 section 1 (not where the dowel stick was placed) to the end of the field. The end of the field will be measured from row 1 back to the inner edge of the board placed at the corner of the field.

LAND USE AND CROP IDENTIFICATION

These instructions apply only to Hidalgo, Willacy and Cameron Counties. Aerial photographs will be taken each month at the time of the survey. To go along with these flights we need some information as to crops grown or land use, stage of development and so on as indicated below.

You will be provided with several Itek prints of each segment. You must outline all fields in the segment in red pencil and number. Each field is then identified on the form "Land Use and Crop Identification" that is provided.

The procedure to follow will be to take one field at a time as you proceed around or through each segment and note your observations on the form.

A. Field Number

The field numbers in the left hand column correspond to the fields on the Itek print. The specific sequence of numbering is determined initially by the sorghum fields selected within the segment. The remaining fields should be numbered with a red pencil in the most convenient manner as determined by the path of travel.

B. Land Use or Crop

In column two specify the land use or crop type. If plants are visible but not yet identifiable, try to establish if the crop is a cereal or a row crop.

C. Stage of Development

The column labeled stage of development refers to the maturity of the crop. This is, with respect to the crop planted in the investigated field, is it fully mature? Is the crop full size or close the full size? On the other extreme, is the crop immature. The stage of development is immature if the plants are visible, but the fruit has not started to develop. Anything between these limits is in class 2. Mature crops are class 3 and immature crops are class 1.

D. Crop Condition

Crop condition refers to the health and vigor of the crop under normal diseased. We have three categories: healthy (1), strained (2), and diseased (3). A healthy crop is one which is in excellent condition under average weather conditions. A crop is said to be strained if there are obvious effects due to lack of or over abundance of water and/or sun. Diseased crops are ones which have been

attacked by some foreign element which has noticably damaged the crop.

E. Soil Condition

Soil condition refers primarly to bare fields or field in which the crop is immature. We classify a field as: wet (1), dry or sandy (2), cultivated (3), and weedy (4). More than one of the above classes may apply to a field.

F. Plant Height

Estimate as closely as possible the height of the crop to the nearest one-half foot up to six feet and to the nearest foot for crops taller than six feet.

G. Remarks

For some land uses, as in the case of a farmstead, some of the spaces will be blank. For example, for a farmstead, it is meaningless to record stage of development or plant height.

If any of the responses for the five cloumns does not fit into the designated categories make a special note in the space provided or in the column labeled remarks. We will now consider a few examples showing how to use the form.

a. Field 1 , sorghum , 1 , 1 , 2 , 1 foot.
b. Field 7 , corn , 2 , 1 , 2 , 6 feet, starting to tassle.
c. Field 13, Bare soil , — , — , 3 , — .
d. Field 22, orange trees , 3 , 2 , 2 , 12 feet , leaves brown.

VI POST HARVEST INTERVIEW

Post-Harvest work will be required for all samples. If you complete a Form E but cannot contact the farmer for some reason to conduct the Form D interview, you may complete the Form D at the time of a later visit in that area.

At the start of the interview, record the time and the date. You will find a brief introduction, stating the purpose of the interview, in the heading of the form.

Item 1 & 2: Acres reported for grain on earlier visit, and acres harvested for grain

Copy Item 1 from Form A, Item 1.

You will point out to the operator on the aerial photograph, the field which has been observed, ask Item 2 and record the acreage harvested or to be harvested for grain from the sample field.

Item 3: Reason for Acreage Difference

If Item 2 differs from Item 1, determine the reason for the difference and record in space provided. In some cases, a part of the field that was intended for harvest as grain may have been abandoned or used for purposes other than grain. The respondent may have confused another field with the sample field. If Item 2 is incorrect, correct the entry. DO NOT CHANGE ITEM 1 FOR ANY REASON.

Item 4: CWT. harvested

Record the "Total CWT." harvested from the sample field. Include grain harvested when opening the field and hand gleaning. If the operator reports "CWT Per Acre" rather than total production, multiply by the acres harvested for grain (from Item 2) and record that figure. Do your multiplication in the margin of the Form D.

Item 5 & 6: CWT. still to be harvested and total production

If more sorghum is to be harvested for grain from the field, the answer in Item 5 will be the "Total CWT" still expected to be harvested.

Item 6 will be the total of Items 4 and 5. If the farmer disagrees with the total when you make this statement, you should ask Items 4 and 5 again to get the correct answer.

Item 7: On what date was or will harvest be completed for this field?

Determine what date the field was or will be completely harvested. Record month and day is space provided in Item.

Item 8: Livestock grazing in field or has it been tilled?

Ask Item 11 "have livestock grazed in this field since harvest or has it been tilled in any manner?", and check Yes or No. If Yes, no form E will be completed in the field. Select an alternate field in the same tract for gleaning, if available.

Check Form D to be certain that all questions have been answered. Then thank the farmer for his cooperation, record the time and sign your name in the space provided.

VII POST HARVEST OBSERVATIONS

General

The post-harvest field gleanings should be completed as soon after harvest as possible, preferably within one week after harvest. This is very important!

The observations will be taken on two sample units as soon as possible after the farmer has completed harvesting or picking the field. The unit location rows and paces have been entered in the shaded areas on the Form E's. The four 3-foot gleaning sections should be measured in accordance with the instructions shown on the next page.

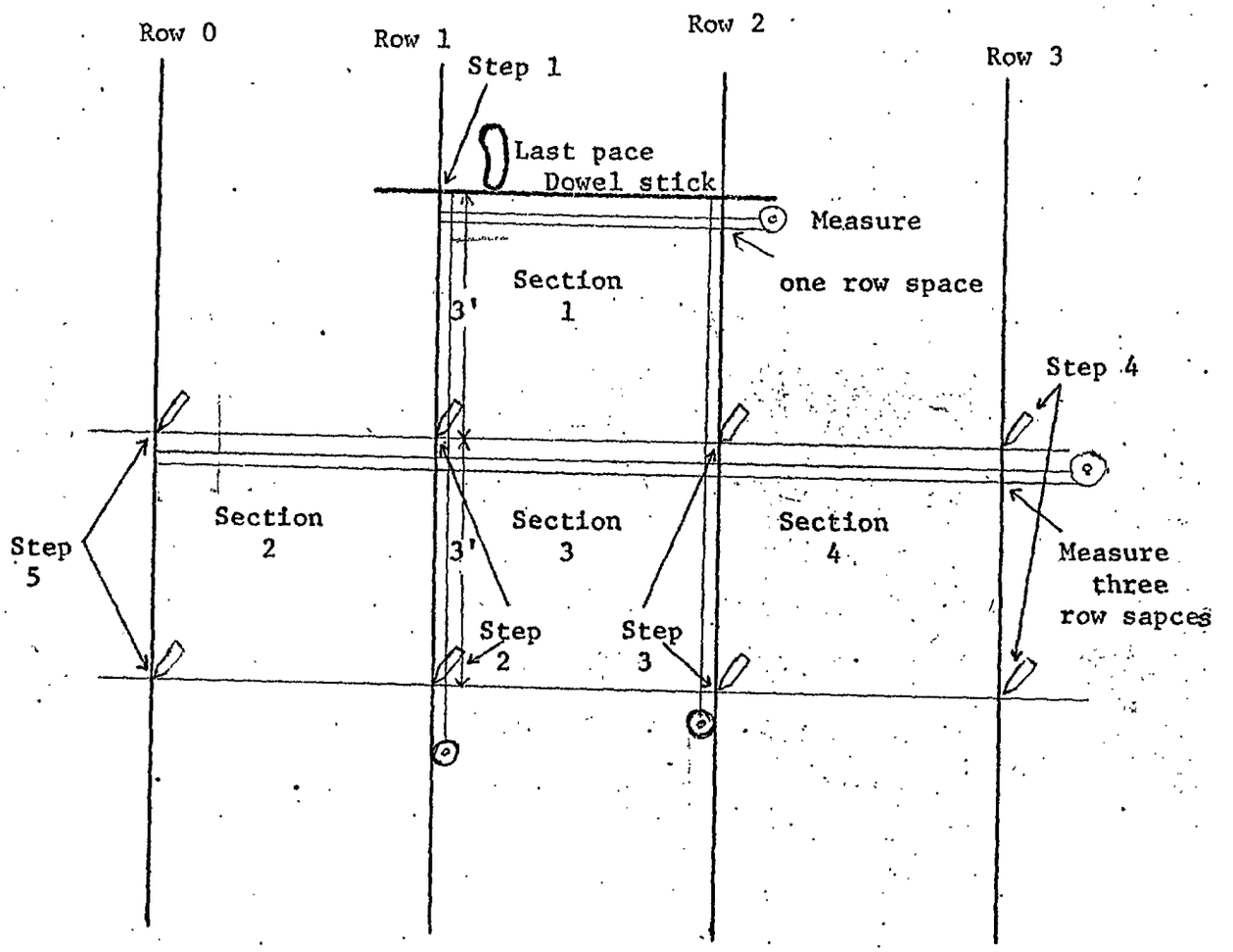
For the purpsoe of post-harvest gleaning observations, each 3-foot section will include rows and the associated row "middles." Each row width will include the stalks in the row concerned and the middle with which it is associated up to, but not including, the stalks in the adjacent row. Florist stakes should be placed at the corners of the gleaning section to mark the end of the rows and middles to be gleaned. Connect ribbon to these stakes to give a better line for ends of the sections.

If the sample field (or that part of the sample field containing the post-harvest units) has not been harvested, you may take the post-harvest observations in another part of the sample field or in a harvested sorghum field in the same tract, if one is available. In the latter case, use the row and pace numbers on Form E to locate the units and note that observations were made in an "Alternate Field." Also, if the sample field has been disced, plowed up or livestock have grazed in the field, you should take the closest harvested field in the same tract as an alternate. If no alternate fields are available, enter this information below Item 5. In such cases, the sample is lost and no post-harvest observation will be made.

Record the date and time you leave the corner of the field for each unit.

Item 1(a): Width across one row space, feet and tenths.

At the dowel stick, measure the distance across the first row space with the tape, beginning at the center of the stalks in the first row in the unit and measuring to the center of the stalks in the second row in the unit. This



Step 1: Walk along end of rows and required paces into field as for layout of the regular unit and lay down dowel stick.

Step 2: Attach end of 50 foot tape at dowel beside row 1.' Measure out and place florist stakes at the 3' and 6' marks in center of row at right angle to row.

Step 3: Repeat step 2 beside row 2.

Step 4: Sight across stakes in row 1 and row 2 and place at stake in row 3 in line with each set.

Step 5: Repeat step 4 and place stakes in row 0.

Step 6: Place string or flagging ribbon across the rows and tie to end stakes to mark boundaries for section 2, 3 and 4.

is the distance across the first middle. Record this distance in feet and tenths of feet. Be sure you tape is calibrated in feet and tenths of feet and not in feet and inches.

Item 1(b): Width across 3 row spaces, feet and tenths.

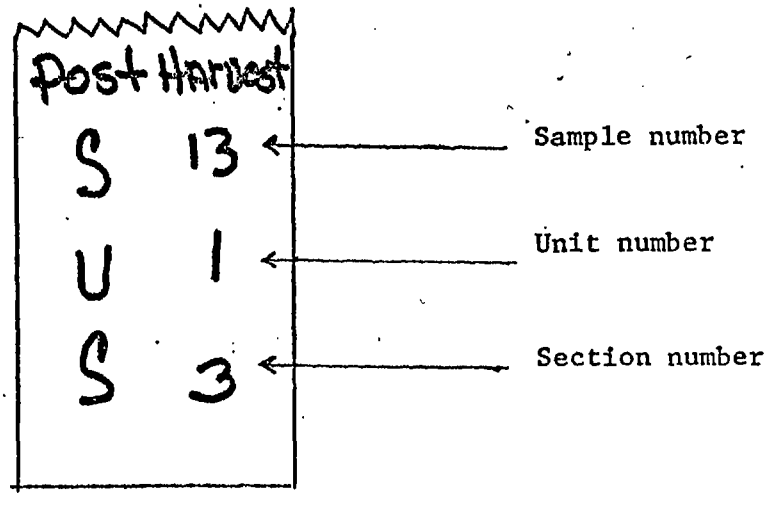
At the three foot mark, measure the distance across three row spaces with the tape. Start from the center of the stalks in Row 0 and measure in the direction of Row 1 across three row spaces, or middle to the center of the stalks in Row 3. Record the distance in feet and tenths of feet.

In Item 2 thru Item 4 do one section at a time before continuing with the next.

Item 2: Pick all heads attached to stalks in each section and deposit in bag.

Pick all heads attached to plants in Rows 0, 1 and 2 of each 3 foot section. Row 0 belongs with section 2, Row 1 belongs with section 1 and 3 and Row 2 belongs with section 4. See layout for post-harvest gleaning units. Place the heads in a paper bag labeled for that particular section. Check box ( ) for each row in each section as completed. Clip off stems as close as possible to the head.

Label the paper bag with the marking pencil as shown in the diagram below.



Item 3: Pick all heads and pieces of heads in each middle and deposit in bag.

Pick up all heads and pieces of heads, large or small, laying on the ground inside of the section. In looking at the diagram of the layout each section includes the area from the stalks in the row on the left up to, but not including, the stalks in the row on the right.

Doubtful heads or pieces of heads laying on the edge of the row on the left should be included while the doubtful heads or pieces of heads laying on the edge of the row on the right should be excluded.

Place in bag with heads from Item 2.

Item 4: Pich up all loose grain in each middle and deposit in bag.

From the row on the left and its associated middle up to, but not including the row on the right, pick up all loose grain on the ground in each unit and deposit in the bag with the heads in Items 2 and 3. Doubtful kernels on the edge of the row on the left should be included and doubtful kernels on the edge of the row on the right should be excluded. Clear away all trash to expose the bare earth and any grains that may have been "hidden".

Item 5: Was an alternate field used for making post-harvest observation? Yes ( ) No ( )

If post-harvest observations cannot be made, give reason here:

_____

_____

Check yes or no as to whether an alternate field was used or not. If no post-harvest observations were made give the reason in the space provided.

Enter your ending time in the appropriate box. When Unit 1 is completed, go back to starting corner and locate Unit 2 and do the gleaning operations for it.

VIII. MAILING OF FORMS AND SAMPLES

Appropriate envelopes, cloth mailing sacks or boxes should be in your supplies for mailing purposes.

Forms A and B: Mail in Big brown envelope addressed to Washington, D.C. when each months observation are completed.

Heads 6 through 10 from outside unit: These heads will be in in individual paper bags. Place each set of 5 heads in a cloth mailing bag and send to the state office in Austin, Texas. These should be mailed daily.

Mature 18 heads from each unit: These heads will be in individual paper bags. Place these paper bags in the cardboard boxes provided and mail to the state office in Oklahoma City, Oklahoma. One box is provided for each unit or each 18 heads from a sigle unit. These may be mailed daily.

Post-Harvest Samples: These heads or samples will also be placed in a cardboard box and sent to the state laboratory in Oklahoma City. Place as many as possible in one box without crushing and tearing the paper bags.

Forms D and E: Place these forms in a large brown envelope and place in the top of the box of post-harvest gleanings and send to the state laboratory in Oklahoma City.